CHAPTER 7 CONTENTS

CHAPTER 7, RADIOLOGICAL RECORDS

Part 1, General Provisions

Article 711, Purpose

Practices for preparing and retaining Radiological Control records are prescribed in this chapter. The work force and management are required to use records to document radiological safety afforded to individuals on-Site. Records of the radiation protection program may be required to support worker health studies and future disputes or claims. Therefore, these records will be high quality, readily retrievable, and managed for the prescribed retention period. Consideration will be given to cross-referencing related records to aid retrievability. Records will be handled so that personal privacy is protected. Proven electronic and digital records and processes may be acceptable if they are demonstrated to be of adequate quality.

Article 712, Records Management Program

1. A radiological records management program will be established. This program will ensure that auditable records and reports are controlled through the stages of creation, distribution, use, arrangement, storage, retrieval, media conversion (if applicable), and disposition. The records management program shall be sufficient to ensure that records are maintained as necessary to document compliance with 10 CFR 835 [see 10 CFR 835.701(a)] and should include records of the following:
    a. Radiological Control policy statements.
    b. Radiological Control procedures.
    c. Individual radiation doses.
    d. Internal and external dosimetry policies and procedures (including technical basis documents).
    e. Personnel training (course records and individual records).
    f. Implementation of the ALARA program.
    g. Radiological instrumentation test, maintenance, and calibration.
    h. Radiological surveys.
    i. Area monitoring dosimetry results.
    j. Radiological work permits.
    k. Radiological performance indicators and assessments.
    l. Quality assurance measures.
    m. Radiological incident and occurrence reports (and critique reports, if applicable).
    n. Sealed radioactive source accountability and control.
    o. Release of material to controlled areas.
    p. Reports of loss of radioactive material.

2. When radiological services (e.g., dosimetry and laboratory analyses) are purchased, a clear agreement should be in place for the responsibility of record keeping during performance of the service. Records of results should reside in the custody of the originating organization.

3. Detailed information concerning an individual's exposure shall be made available to that individual, upon request, consistent with the Privacy Act of 1974, which contains requirements to protect the privacy of individual records [see 10 CFR 835.702(f) and 801(d)].

Article 713, Record-keeping Standards

1. Radiological control records should be accurate and legible. The records should include the following:
   a. Identification of the facility, specific location, function, and process.
   b. Signature or other identifying code of the preparer and date.
   c. Legible entries in black ink.
   d. Corrections identified by a single line-out, initialed and dated.
   e. Supervisory signature or other identifying code to ensure review and proper completion of forms.
2. The Radiological Control organization will maintain a file of names, signatures, codes, and initials for future identification of the individual who certified, signed, or initialed a record.
3. Radiological control records should not include:
   a. Opaque substances for corrections.
   b. Shorthand or other nonstandardized terms.
4. Similar procedural standards should be established for computerized or digital records.
5. Unless otherwise specified, Radiological Control records shall use units of curie, roentgen, ~~radiation absorbed dose (~~rad~~)~~, and ~~roentgen equivalent man (~~rem~~)~~ including multiples of these units [see 10 CFR 835.4]. Use of the International System of Units (becquerel, gray, and sievert) will be limited to calculational, scientific, or reference purposes.

Part 2, Employee Records

Article 721, Employment History

1. Efforts shall be made to obtain records of prior years' occupational doses for each ~~general employee who is a~~ radiological worker whose occupational exposure is monitored in accordance with Article 511.1 or 521.1. If formal records of previous occupational doses cannot be obtained, a written estimate signed by the individual may be accepted [see 10 CFR 835.702(d)]. Where practical, the association between the radiation dose and job

function should be preserved for trending purposes and future worker health studies. The following information should be maintained:

a. Previous work history detailing radiological work assignments, to the extent practical, and yearly occupational doses at other DOE and non-DOE facilities.

b. Nuclear Regulatory Commission Form 4 or an equivalent that documents previous occupational radiation doses.

c. Ongoing work history documenting work assignments and radiation doses. The facility and occupational codes defined in DOE O 231.1A will be used for this process.

d. Standardized DOE forms to document previous and ongoing radiation doses.

~~e.Upon request, Site Radiation Dosimetry Records will provide contractor employees traveling to noncontractor facilities an official letter indicating current exposure information and the amount of exposure the employee will be allowed at the noncontractor facility. The noncontractor facility will be requested to report doses, including zero doses, received at that facility to Site Radiation Dosimetry Records.~~

Article 722, Personnel Radiological Records

1. Individual monitoring records shall be maintained to demonstrate compliance with regulatory limits [see 10 CFR 835.701(a)].

   a. Records of doses received by all individuals for whom monitoring is required shall be maintained [see 10 CFR 835.702(a)]. Records of zero dose for these individuals also should be maintained.

   b. These records shall be sufficient to evaluate compliance with all applicable dose limits and monitoring and reporting requirements [see 10 CFR 835.702(c)(1) and (2)].

2. Radiation dose records shall contain information sufficient to identify each person, including social security, employee number, or other unique identifier [see 10 CFR 835.702(c)(2)].

3. Procedures, data, and supporting information required to reconfirm an individual's dose at a later date shall be maintained [see 10 CFR 835.702(g)].

4. External dose records shall include applicable extremity, skin, lens of the eye, and whole-body dose monitoring results [see 10 CFR 835.702(c)(3)]. These doses are usually measured with personnel dosimeters, but records may include:

   a. Evaluations resulting from anomalous dose results such as unexpected high or low doses.

   b. Dose reconstructions from lost or damaged dosimeters, or for unbadged workers.

   c. Evaluations of nonuniform radiation doses.

5. Internal dose records shall include CEDE [see 10 CFR 835.702(c)(4)(i)], committed dose equivalent to the affected organs and tissues [see 10 CFR 835.702(c)(4)(ii)], and identity of radionuclides [see 10 CFR 835.702(c)(4)(iii)]. The supporting information typically includes the following:
   a. Applicable whole-body and lung counting results including the chest wall thickness measurements where applicable.
   b. Applicable urine, fecal, and specimen analysis results including estimated intake.
   c. Dose assessment, as required.
6. Records of the summation of external dose and committed dose equivalent to any organ or tissue receiving a reportable dose shall be maintained for the individual receiving such dose [see 10 CFR 835.702(c)(5)(ii)].
7. The TEDE received by each individual monitored in accordance with Article 511.1 or 521.1 shall be maintained for each year during which the individual is monitored [see 10 CFR 835.702(c)(5)(i)].
8. The dose equivalent to the embryo/fetus of a declared pregnant worker shall be maintained [see 10 CFR 835.702(c)(6)] and will be maintained with the occupational dose records for that worker.
9. Individual dose records shall include the cumulative TEDE. [see 10 CFR 835.702(c)(5)(iii)].
10. Efforts shall be made to obtain records of doses during prior years for each radiological worker monitored in accordance with Article 521 or 522 [see 10 CFR 835.702(e)]. If an individual's previous employer is not responsive to initial efforts to obtain these records, at least two additional attempts will be made. Records of lifetime occupational dose will be maintained with the individual's occupational dose records.
11. Counseling of individuals about radiological concerns will be documented and the documentation retained. The counseled individual should sign the documentation to acknowledge participation.
12. Records of authorization to exceed administrative control levels will be retained.
13. Planned special exposures shall be accounted for separately from the dose received from nonemergency or nonplanned special exposure [see 10 CFR 835.204~~ and 1302~~].
14. Records of nonuniform dose to the skin need not be retained in an individual's dose records if the dose is less than 2% of the limit for the skin in Table 2-1 [see 10 CFR 835.702(b)] (see Article 723 for requirements for records of radiological incidents and occurrences).
15. A personnel exposure questionnaire (PEQ)~~, Form ID F-102, the Special Dose Evaluation Form ID F-102,~~ are~~is~~ is used by dosimetry and Radiological Control personnel to estimate the dose received by an individual (external or internal) when the dose cannot be determined by normal means. ~~Both~~ The three signature spaces are required to be completed to verify independence in the dose assessment. The PEQ becomes part of the

individual's dose records. After the PEQ investigation, the responsible line manager may determine that a critique report or occurrence report is required for further investigation and corrective action. Events requiring completion of a PEQ include, but are not limited to:

a. Lost TLD badges.

b. Lost TLD inserts.

c. Entry into a radiation area, high radiation area, locked high radiation area, or very high radiation area without proper dosimetry.

d. Crushed or damaged TLD badge.

e. Malfunction during TLD processing.

f. Contaminated TLD badges.

g. Failure to wear a TLD badge when required.

h. Doses that seem unreasonable for the exposure situation.

16. Dose reconstruction, special studies, evaluations, and interpretations to support activities such as exposure questionnaire reviews, evaluation of nonuniform exposures to radiation, investigations of incidents, and internal dose assessments are part of the Site ~~radiation dosimetry~~radiological records. In those cases where recordable doses are determined to have occurred, the results of these evaluations, consisting of a summary report that (1) describes the data, (2) explains the techniques used to evaluate the data, and (3) lists the doses to be assigned, are required to be provided to Site Radiation Dosimetry Records.

Article 723, Other Personnel Radiological Records

1. The complete records of radiological incidents and occurrences involving personnel dose will be retained in, or cross-referenced to, the individual's dose records.

2. Records related to doses exceeding Table 2-1 limits shall be maintained in the individual dose records and include the following information:

   a. Planned special exposures.

   b. Other nonauthorized doses exceeding limits.

   ~~b.Unplanned dose from radiological incidents and occurrences.~~

   c. Authorized emergency doses [see 10 CFR 835.702(a) and 10 CFR 835.1301(b)].

3. Records of employee radiological safety concerns that have been formally investigated and documented will be maintained.

4. Records of the formal written declaration of pregnancy, including the estimated conception date, and revocations of declarations of pregnancy shall be maintained [see 10 CFR 835.704(d)]. Records indicating an end to the pregnancy (therefore, the conditions of Article 215 do not apply) also should be maintained.

Article 724, Medical Records

Maintenance of records of nonoccupational radiation doses such as significant therapeutic or diagnostic radiation doses for medical purposes is encouraged. Where practical, maintenance of records of preemployment nonoccupational radiation doses is encouraged.

Article 725, Radiological Training and Qualification Records

1. Records of training and qualification in radiological control are maintained to demonstrate that an individual received appropriate information to perform the work assignment in a safe manner. Qualification standard records are retained for on-the-job and practical factor training as well as for formal classroom training.
2. Formal records or summary reports of training and qualification should be readily available to first-line supervision and management of involved personnel to aid in making work assignments.
3. Personnel training records shall be controlled and retained [see 10 CFR 835.704(a)]. At a minimum, these records should include the following:
    a. Course title.
    b. Attendance sheets with the instructor's name.
    c. Employee's name, identification number, and signature.
    d. Date of training.
    e. Identification of the examination or evaluation form, including sufficient data to identify which test each individual completed.
    f. Verification document or record confirming satisfaction of the training requirement.
    g. Documentation related to exceptions for training requirements and extensions of qualification.
    h. Quizzes, tests, responses, and acknowledgments of training, with the date and signature of the individual trained.
    i. Special instructions given to females, their supervisors, and coworkers about prenatal radiation doses, acknowledged by the worker's signature.
4. Records shall be retained for the following types of radiation safety training [see 10 CFR 835.704(a)]:
    a. General Employee Radiological Training.
    b. Radiological worker training.
    c. Periodic training.
    d. Training for members of the public for unescorted access.
5. Records should be retained for the following types of radiation safety training:

a. Instructor training.

b. Radiological control technicians and RCT foremen.

c. Training of other Radiological Control personnel.

d. Respiratory protection training.

e. Qualifications for special tests or operations.

f. Orientation of members of the public.

g. Training of emergency response personnel.

6. Records shall be maintained as necessary to demonstrate that individuals who are responsible for the development and implementation of measures necessary to ensure compliance with 10 CFR 835 have the appropriate education, training, and skills to execute these responsibilities [see 10 CFR 835.103 and 10 CFR 835.701(a)]. These records should include records of the training provided in accordance with Parts 4 and 5 of Chapter 6.

7. The following instructional materials should be maintained:

   a. Course name, with revision and approval date.

   b. Instructor's manuals, course content, or lesson plans containing topical outlines.

   c. Video and audio instructional materials including the dates and lessons for which they were used.

   d. Handouts or other materials retained with the master copy of the course.

   e. Job-specific training documents such as instrument use, radiological procedures, radiological work permit special training requirements, pre-job briefings, and mockup training.

Part 3, [Reserved]

Part 4, Radiological Control Procedures

Article 741, Policies, Procedures, and Radiological Work Permits

Radiation protection program records will consist of policy statements, procedures, work authorizations, and supporting data. The records should be maintained in a chronological sequence that will allow correlation with the corresponding support information. For example, procedures for performing radiation surveys will be identifiable with the survey results. Completed RWPs will be maintained.

Article 742, As Low As Reasonably Achievable Program Records

Records of actions taken to maintain occupational exposures ALARA shall be maintained [see 10 CFR 835.701(a)]. These records shall include facility design and control measures [see 10 CFR 835.704(b)] and should include:

a. Plans and goals of the ALARA program.

b. Minutes of ALARA committees and other committees where radiological safety issues are discussed formally.

c. Records of pre-job briefings and post-job evaluations.

d. Records of temporary shield and portable ventilation installation and removal.

Article 743, Quality Assurance Records

Records of quality assurance reviews and audits developed for radiological control functions shall be retained to ensure that sufficient records are specified, prepared, reviewed, approved, and maintained to accurately reflect completed work [see 10 CFR 835.704(c)]. Additional information about quality assurance records is provided in DOE O 414.1A, "Quality Assurance," and 10 CFR 830.122, "Quality assurance criteria." Quality assurance records should include:

a. Assessment plans.

b. Assessment results.

c. Assignment of corrective actions.

d. Completion and verification, if required, of corrective actions.

Part 5, Radiological Monitoring

Article 751, Area Monitoring Records

1. Radiological control programs require the performance of radiation, airborne radioactivity, and contamination monitoring to determine existing conditions in a given location. Maps with sufficient detail to permit identification of original survey and sampling locations will be maintained. Radiological monitoring results will be recorded on appropriate standard forms and include the following common elements:

   a. Date, time, and purpose of the survey.

   b. General and specific location of the survey.

   c. Name and signature or code of the surveyor and analyst.

   d. Pertinent information required to interpret the survey results.

   e. Reference to a specific radiological work permit if the survey is performed to support the permit.

2. Records shall be maintained to document:

   a. Results of monitoring and surveys for radiation and radioactive materials [see 10 CFR 835.703(a)].

   b. Results of monitoring and calculations used to determine individual occupational doses [see 10 CFR 835.703(b)].

   c. Results of surveys for release of materials from radiological areas [see 10 CFR 835.703(c)].

d. Results of sealed radioactive source leak tests and inventories [see 10 CFR 835.704(f)].

e. Results of surveys of radioactive material packages received from transportation [see 10 CFR 835.405 and 701(a)].

f. Changes in monitoring equipment, techniques, and procedures [see 10 CFR 835.704(e)].

3. Records for release of materials from radiological areas should describe the property, the date of the last survey, the identity of the individual who performed the survey, type, and identification number of the survey instruments used, individual items released, and the survey results. For small items and packages of similar items such as boxes of tools or boxes of fasteners, creating a separate survey record is not necessary for each item. However, the survey record should provide traceability to the individual removing the item from the radiological area.

Article 752, Radiation Monitoring

In addition to the elements provided in Article 751, records of radiation monitoring will include, at a minimum, the following information:

a. Instrument model and serial number, (the Health Physics Instrument Laboratory bar code, when on an instrument, should be used as the serial number).

b. Results of the measurements of area dose rates with a minimum reporting level of 10% of the lowest scale gradient or as specified on the calibration sticker.

c. Locations of hot spots and other radiological hazards.

d. Facility conditions existing during the survey that may have affected radiological conditions.

Article 753, Airborne Radioactivity Monitoring

In addition to the elements provided in Article 751, records of airborne radioactivity monitoring should include, at a minimum, the following information:

a. Model and serial numbers of the sampler and laboratory counting instrument when available or unique identifier of each sampler and instrument and appropriate supporting parameters including counting efficiency, counting time, and correction factors.

b. Locations of fixed air samplers.

c. Locations of portable air samplers used for a survey.

d. Air concentrations in general airborne areas and breathing zones.

e. Supporting parameters including collection efficiency, flow rate, duration of sampling, correction factors, and filter medium.

f. Identification (e.g., names or employee numbers) of individuals in the area for whom DAC-hour exposures are calculated.

Article 754, Contamination Monitoring

1. In addition to the elements provided in Article 751, records of contamination monitoring will include, at a minimum, the following information:
   a. Model and serial number of counting equipment.
   b. Contamination levels (using appropriate units) and appropriate supporting parameters including counting efficiency, counting time, correction factors, type of radiation, and whether the contamination was fixed or removable.
   c. Location of areas found to contain hot particles or high concentrations of localized contamination.
   d. Follow-up survey results for decontamination processes with cross-references to the original survey.

Article 755, Sealed Radioactive Source Leak Tests and Inventories

1. In addition to the elements provided in Article 751, records of sealed radioactive source leak tests should include, at a minimum, the following information:
   a. Model and serial number of counting equipment.
   b. Contamination levels (using appropriate units) and appropriate supporting parameters including counting efficiency, counting time, correction factors, and type of radiation.
   c. Corrective actions for leaking sources.
2. Records of accountable sealed radioactive source inventories shall include, at a minimum, the following information [see 10 CFR 835.704(f) and 10 CFR 835.1202(a)]:
   a. Physical location of each accountable sealed radioactive source.
   b. Verification of the presence and adequacy of associated postings and labels.
   c. Verification of the adequacy of storage locations, containers, and devices.

Part 6, Instrumentation and Calibration Records

Article 761, Calibration and Operational Checks

1. Calibration records for fixed, portable, and laboratory radiation measuring instruments and equipment and individual monitoring devices shall be maintained [see 10 CFR 835.703(d)]. These records should include frequencies, method, dates, personnel, training, and traceability of calibration sources conforming with National Institute of Standards and Technology or other acceptable standards.
2. Calibration and maintenance records shall be maintained for instruments and equipment used for monitoring [see 10 CFR 835.703d]. Calibration and maintenance records should be maintained for the following equipment:
   a. Portable survey instruments.
   b. Bioassay measurement equipment.

c. Laboratory, counting room, and fixed radiation measuring equipment.

d. Process and effluent monitors and sampling equipment.

e. Radiation area monitors.

f. Portal monitors and other personnel contamination monitors.

g. Pocket and electronic dosimeters.

h. Air sampling equipment.

i. Tool and waste monitoring equipment.

j. Protective clothing and equipment monitors.

3. Documentation of instrument ~~operational~~ performance checks shall be maintained [see 10 CFR 835.701(a) and 10 CFR 835.401(b)(4)]. Such performance check records should be maintained for a period not shorter than the calibration period of the instrument.

4. Maintenance results for each instrument and device shall be created and retained [see 10 CFR 835.703(d)]. Maintenance histories for each instrument and device should be created and should include the nature of any defects and corrective actions taken.

Article 762, Special Calibration Records

Records of additional tests and checks of instrumentation used in conjunction with a suspected overexposure, questionable indication, or unusual occurrence will be retained. In addition, records of special instrument calibrations and modifications made in accordance with Article 562.6 shall be retained [see 10 CFR 835.703(d)].

Part 7, Records Management

Article 771, Media

A combination of media may be used for a comprehensive records system. All records should be stored in a manner that ensures their integrity, retrievability, and security and, unless otherwise specified, shall be retained until the final disposition is authorized by DOE [see 10 CFR 835.701(b)].

Article 772, Microfilm

Records may be microfilmed provided that the resulting film copy is capable of producing a clear, legible copy after storage for the specified period. The following controls should be administered:

1. Verification that the resultant copy is legible.

2. Confirmation that printed sides are copied.

3. Periodic quality audits of the final filmed copy.

Article 773, Computerization of Records

1. Records may be transferred to magnetic or electronic storage media provided certain precautions are taken to ensure that the information is maintained in a retrievable configuration.
2. Controls for the use and handling of magnetic storage media should include the following:
   a. A master index of documents on the magnetic storage medium.
   b. A program to ensure backup and retrievability of information.
   c. Quality control during data entry and analysis.
   d. An index identifying software applications used in conjunction with the data.
   e. Software validation and verification.
   f. Periodic quality audits of software.
   g. Prevention of unauthorized manipulation of data.
   h. Assurance that previously stored information is retrievable and usable after system modifications.
3. Optical disks may be used to archive records if the optical disks satisfy the following:
   a. A reliable system to prevent overwriting or erasure of records.
   b. Software and user controls consistent with Article 773.2.
   c. Manufacturer recommendations relating to software control, disk life expectancy, environmental storage conditions, and maintenance incorporated into policies and procedures.
   d. Quality controls on the copying and imaging processes consistent with Article 772.

Article 774, Retention

1. Requirements for retaining records are established in 10 CFR 835. Upon cessation of activities that could result in the occupational exposure of individuals, all required records related to individual exposure monitoring shall be transferred to DOE [see 10 CFR 835.702(h)].
2. Once a record has been created, reviewed, and signed by appropriate supervision, the record is considered complete and is not to be modified. Subsequent errors identified in a completed record may be corrected by creating a supplemental record that includes traceability for the correction.

Article 775, Physical Protection of Records

1. Methods for protecting documents will include vaults, file rooms with fixed fire suppression, fire-rated cabinets, duplicate storage, or combinations of these as required by Site records procedures.

2. Storage arrangements should address physical damage that could be caused by temperature extremes, moisture, infestation, electromagnetic fields, excessive light, stacking, theft, and vandalism.

3. Records should, as a minimum, be protected from:

   a. Exposure to fire, equivalent to an Underwriters Laboratories 1-hour, or greater, fire-resistance rating.

   b. Exposure to water damage caused by a 100-year flood.

   c. Exposure to windstorm velocities of 100-year recurrence.

Part 8, Radiological Reporting

Article 781, Reports to Individuals

1. Individuals who are monitored in accordance with Article 511.1 or 521.1 shall be provided with an annual report of their dose [see 10 CFR 835.801(c)]. Electronic distribution may be used. Upon request, an individual shall be provided detailed information concerning his or her exposure, consistent with the Privacy Act [see 10 CFR 835.801(d)].

2. Upon request, terminating employees shall be provided a report, as soon as data are available but not later than 90 days following the last day of employment. A written estimate, based on available information, shall be provided upon termination, if requested [see 10 CFR 835.801(b)].

   a. If an internal dose assessment is still in progress at the 90-day limit, the employee will be notified of its status, and provided with the interim, or final dose record, as soon as the assessment is complete.

   b. If a terminated employee is provided a report at termination, he or she will not be provided an annual report.

3. Reports of individual doses shall include the site or facility name, the individual's name and social security number, the employee number or other unique identification number, and all dose information required by Articles 722.4 through 722.9 [see 10 CFR 835.801(a)]. Reporting of lifetime occupational dose is suggested.

4. Reports of individual exposure to radiation or radioactive material required under DOE O 231.1A or as a result of a planned special exposure, emergency exposure, or accident will be submitted to DOE in accordance with applicable occurrence reporting requirements. Copies of the individual dose information contained in these reports shall be provided to the affected individual at a time not later than transmittal of the report to DOE [see 10 CFR 835.801(e)].

5. Monitoring results should be reported to each member of the public monitored in accordance with Article 511 or 521 within 30 days and no later than 90 days after the end of the visit. The report may serve as the annual report to these individuals. However, if an individual visits a site or facility more than once in a year, then an annual report should be sent which sums the doses from all of the visits.

6. Upon request, Site Radiation Dosimetry Records will provide contractor employees traveling to noncontractor facilities an official letter indicating current exposure information and the amount of exposure the employee will be allowed at the noncontractor facility. The noncontractor facility will be requested to report doses, including zero doses, received at that facility to Site Radiation Dosimetry Records.

Article 782, Annual Radiation Report

Reporting requirements for the Annual Radiation Dose Summary report are provided in DOE O 231.1A. This report includes internal and external radiation dose results for monitored Site employees, and for monitored members of the public.